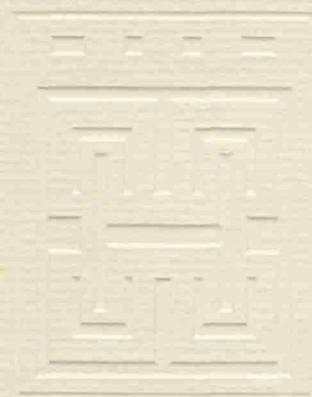
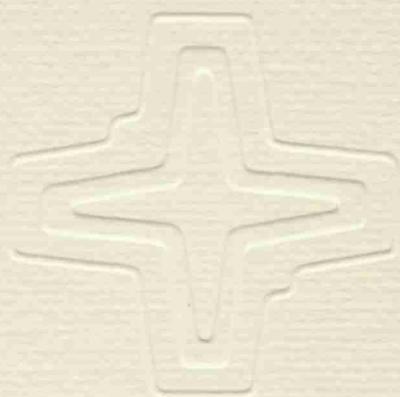


# MOTOROLA ANNUAL REPORT 1961



## *A Progress Report...Integrated Circuitry*

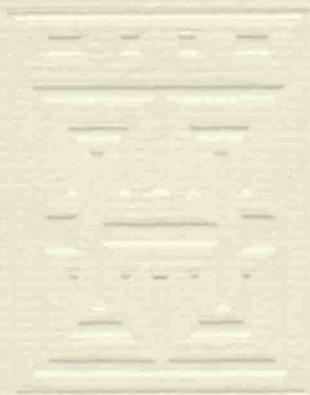
*The Cover* designs symbolize three basic integrated circuit technologies through which Motorola is gaining leadership identification in the art of solid state electronics.

The *circular* design represents a ferrite logic core. With the addition of wire windings, this multi-aperture device becomes a complete circuit for a digital computer.

A star planar transistor—the *center* design—symbolizes the epitaxial technique of growing crystals on substrates. The *rectangular* design illustrates the configuration of most integrated circuits of the future.

Motorola's work on such integrated circuits involves a synthesis of the sciences of chemistry, physics, metallurgy, mathematics, and electronics. The arts and skills required in semiconductor processing, thin film technology, surface passivation, and electronic ceramics are based upon these sciences.

Through the combined efforts of many specialists working in the Motorola research laboratories, substantial advances have been made in the practical production of the integrated circuit equivalents of resistance, capacitance, and inductance. Multiple circuit elements are being produced in semiconductor substrates by means of diffusion, alloying, and epitaxial growth, and upon insulator substrates through the use of vapor deposition and advanced thin film techniques.



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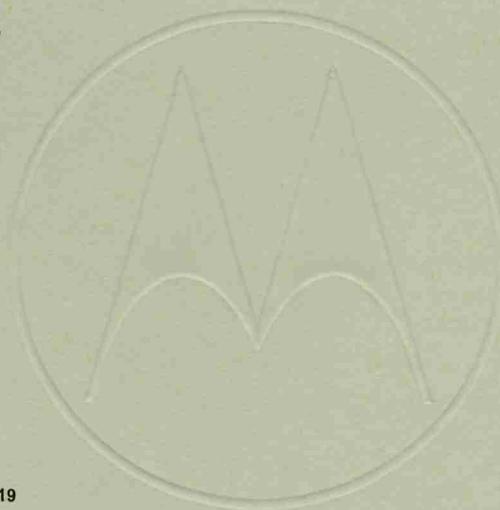
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## HIGHLIGHTS OF 1961

*Business "Dispatcher" two-way mobile radio introduction.*

*Motorola equipment for NASA space vehicles.*

*Record level in foreign sales and licensing income.*

*Electronic alternator and ignition systems for automobiles.*

*Third consecutive Mahogany Association Award for furniture craftsmanship.*

*Application of epitaxial and planar production techniques to semiconductors.*

*"Extender" noise suppression circuit for MOTRAC two-way radio.*

*Modern communications system for Chicago Police Department.*

*All-transistor aircraft flight control system.*

*Divisional status for Solid State Systems.*

# TO THE SHAREHOLDERS

The mood and dynamics of Motorola's markets changed dramatically from the early to the latter part of the year. The hesitancy of the consumer to purchase durable goods and the indecisiveness of the commercial and military buyer during most of the first half of 1961, are well known.

In contrast, as the year ended the consumer was displaying a confident mood...the industrial market firmed...and military programs were expanding. This uneven tempo of business was the biggest single influence on 1961 earnings which declined to \$2.36 per share compared with \$3.14 in 1960.

In addition, special circumstances in the semiconductor market are significant. Competition was intensified by industry overcapacity for many devices, less than anticipated demand in certain areas, and substantial erosion of prices through the year. In spite of this, Motorola's Semiconductor Products Division increased its dollar volume considerably and maintained virtually the same excellent profit it reported in 1960.

Also noteworthy, sales volume and licensing income from our international operations were up 24%, and earnings more than doubled.

The improved momentum in practically all of Motorola's markets—well in evidence as the year ended—promises better volume and particularly better earnings for the Company in 1962.

At the close of 1961, field inventories of consumer goods were moderate, making it possible for distributors and dealers to add to their stocks. Motorola's share of the television and phonograph markets was steadily growing. Automobile sales were continuing at a brisk pace through the winter; car radio volume was up accordingly.

Though temporarily slowed early in 1961, the Communications Division continued its uninterrupted year-after-year pattern of sales increases, and confidently predicts further gains in 1962. Unit and dollar volume in the Semiconductor Products Division are mounting though cost and price pressures will make it difficult to maintain last year's fine profit record. We look forward to perhaps a 30% increase in military sales for 1962.

More product developments and scientific achievements of significance matured in 1961 than in any other year in our history. The most long range of these are in solid state electronics. Our achievements in molecular structures, integrated circuits, solid state process controls, and a variety of solid state devices have made it appropriate for us to establish a sixth important Motorola division called the Solid State Systems Division. In addition, we announced many other developments with more immediate potential.

I call your attention to our balance sheet which for the first time consolidates Motorola Finance Corporation. Much of the long and short term debt is for the purpose of financing the \$40,000,000 in notes and contracts owned by the finance company. Two-thirds of last April's \$30,000,000 public issue of debentures was for this purpose.

In general, markets for all of Motorola's products will be larger and more orderly in 1962. Your company is ready to take advantage of its opportunities, and this is evidence of the achievements and imagination of my associates.

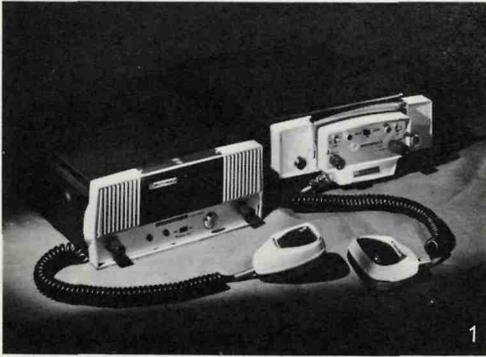
*For the Board of Directors*

*Robert W. Galvin*  
March 13, 1962

*President*



# COMMUNICATIONS DIVISION



Most prominent of the communications products introduced in 1961 are: 1/ the Business "Dispatcher" two-way mobile radio (left)—together with the well-known MOTRAC radio featuring the new "Extender" noise suppression device • 2/ the Low Frequency Pocket Radio Pager (right)—smallest yet of Motorola's family of pocket radio products • 3/ new closed circuit TV control panel, monitor, and transistORIZED camera • 4/ all-transistor flight control system • 5/ control center for Motorola-built Chicago police communications network.

The Communications Division increased its lead in the two-way radio field despite intense competition in 1961. Sales volume increased and earnings kept pace, aided by the introduction of new products and continued attention to control of costs.

Major performer in the product line continues to be the transistorized MOTRAC two-way radio. New products and improved features introduced in 1961 both strengthened the Division's position in the market and provided a broader base for good performance in 1962.

The Division's aggressive program of research and development resulted in introduction of two significant mobile two-way radio products this past year. In spring, the "Extender" circuit—an ignition noise-suppression device—was introduced as a built-in optional feature of the premium quality MOTRAC two-way radio. Appreciable improvements in communications range and quality result from this circuit which detects and cancels "noisy" ignition pulses. Early in 1962, the circuit in slightly modified form will be offered in an adapter kit for Motorola mobile units already in use.

An entirely new mobile two-way radio, designed primarily for the general business market, was the second significant product development. Called the Motorola "Business Dispatcher" radio, the new unit includes a fully transistorized receiver and power supply economically designed for the smaller business organization. Its features are exclusive to Motorola within its price range.

Noteworthy this past year was the completion of a \$1.5 million communications network system for the City of Chicago Police Department. The system represents the largest single order for a two-way radio system ever received by the Division. It provides Chicago a completely new and modernized police radio network, incorporating new equipment and operational concepts with broad potential for similar ap-

plication in major cities throughout the U.S.

During the latter part of the year, a new pushbutton mobile radio-telephone, combined with Motorola's exclusive transistorized MOTRAC radio unit, was introduced to the independent telephone market.

A new remote control closed circuit television console was announced during the year and development of a transistorized camera and monitor was completed. Both will be marketed in early 1962.

In the miniature equipment field, a new Motorola "Low Frequency Pager" was introduced. New transistor techniques permitted significant advances in miniaturization, reliability, and operating characteristics. This new pocket radio pager is smaller and lighter and has a substantially reduced operating cost as compared with previous pagers. To meet demands of hospitals and industry for larger systems, a high capacity, low frequency base station was engineered with a capacity of up to 900 units.

The miniature product line also contains the VHF radio paging system and the fully transistorized "Handie-Talkie" Pocket Transmitter and Pocket Receiver. During the year several systems of note were completed—such as a city-wide medical paging system for the San Diego, California, county medical society; and two-way networks for foot patrolmen in Washington, D. C., and other major cities.

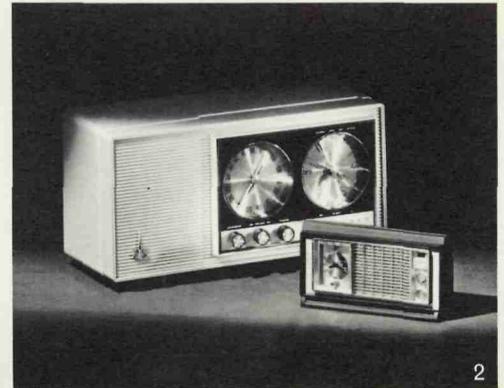
Motorola radio traffic control systems were installed in Hartford and New Haven, Connecticut, during the year and orders were received for new systems from the City of Tampa, Florida, and the New Jersey Turnpike Authority.

The ADF-T-12 all-transistor automatic direction finder, a product of the Division's Aviation Products Department, continues to dominate the market for this type of equipment. The new M-4 all-transistor flight control system—announced during September—already has a reputation as leader in the general aviation "automatic pilot" field.

# CONSUMER PRODUCTS DIVISION



Available to Motorola customers is a full line of home entertainment and car radio products. It consists of: 1/ television receivers and stereo hi-fi phonographs—featuring the well known Drexel and Heritage furniture designs • 2/ clock and table AM and FM radios • 3/ portable radios — including the popular pocket-size units • 4/ portable transistorized TV • 5/ FM and AM car radios and tuners. Motorola, for the third consecutive time, has won the Mahogany Association "Grand Award" for outstanding furniture craftsmanship.



The consumer, anxious about international tension and the business recession, milled around the market place in early 1961 with his money cautiously banked. As a result, many consumer durables fell short of their prior-year levels. Automobiles, television receivers, phonographs, radios, household appliances, and others, all suffered in varying degrees in the first half-year.

The early decline for Motorola consumer products was reversed from mid-year on with sales showing steady improvement during the third and fourth quarters. The comeback was not quite sufficient, however, for the full year to equal 1960, although the fourth quarter ran at a substantially higher level than in the previous year.

Distributor sales volume increased considerably in the last two months, particularly in the major dollar product categories. TV was up 22% over the like period in 1960, and stereo phonograph sales increased 32%. Home radio maintained the same unit volume. Car radio was off somewhat, being unable to meet the surge in demand during this period. This, however, precipitated stepped-up production which will be reflected in wide first quarter increases.

A sharp uptrend was generally evident going into 1962. Both sales and earnings in the consumer products area are expected to show satisfactory increases for the year as a whole.

During 1961, several television manufacturers marketed color receivers using the early-design 21-inch, 70 degree, round picture tube. This tube is the only one currently available and requires a bulky cabinet to house it. Motorola chose not to re-enter the color television market with this approach, convinced that the sales volume would not be adequate for a profitable venture. This proved prudent. The industry color television retail volume for the year was an estimated 170,000 units, less than 3 percent of the some 6,000,000 black and white receivers sold.

To encourage the industry to modernize color television, Motorola's engineers designed and built a working prototype, 23-inch, 90 degree, rectangular color tube. This tube made possible a cabinet of the same size and attractive design as current black and white receivers. The set was demonstrated throughout the country and the tube technology was offered to the entire industry in an effort to attract a tube manufacturer to produce it. At year end, however, no major manufacturer had agreed to make the tube, although the possibility still exists in 1962.

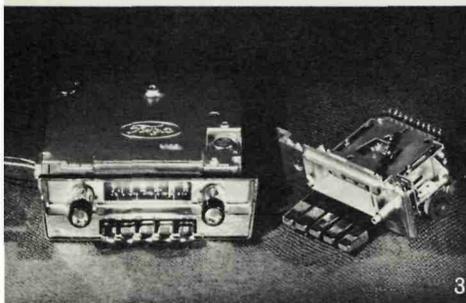
The Company continues to believe that color will become an important product and a source of greater enjoyment for viewers.

Motorola also took a strong stand against "gimmick" merchandising methods such as the "Instant Dividend Plan" sale of television receivers and stereo phonographs through grocery stores.

Motorola completed in 1961 its third year of association with the Drexel Furniture Company and Heritage Furniture, Inc., winning increased recognition for excellence of furniture styling and quality. In the latter part of the year, during the Chicago Furniture Market, the Division held a private showing of 14 unique and original furniture creations incorporating Motorola radio, stereo hi-fi, and television units. These unusual designs, featuring Drexel and Heritage styling and called the "Designer-Decorator Series," include furniture pieces such as coffee tables, serving carts, breakfronts, and hanging wall decks—each housing Motorola radios, TV's, or stereo phonographs.

During the summer, the Company discontinued its display space in Chicago's Merchandise Mart. Negotiations were completed at year-end to open a new salon on the ground level of the well-known Palmer House in Chicago. It will front on State Street a few doors south of Madison—considered one of the world's busiest sidewalks.

# AUTOMOTIVE PRODUCTS DIVISION



Diversification into new product areas, and production of fully-transistorized car radios were two of the major milestones in 1961 for the automotive group. New product developments were: 1/ the transistorized ignition system; and 2/ the all-electronic alternator system with voltage regulator. A miniature tuner 3/ (right), has replaced all other type tuners in Motorola auto radios such as the all-transistor radio shown (left) • 4/ Long lines of alternators move along conveyors at the recently expanded Arcade, N.Y., production facility.

Sales volume of the Automotive Products Division decreased substantially in the first six months because of reduced output in the automobile industry. With the introduction of 1962 models, however, sales returned to a favorable level. Increases are anticipated for 1962 both in car radios and in the significant new automotive products announced during the past year.

In its more than 30 years in the car radio business, Motorola's automotive group has been involved almost exclusively with designing and building radios for automobiles. Announcements in 1961 of new electronic devices to be manufactured for the modern auto marked a noteworthy transition in product diversification for both the Company and the Automotive Products Division.

In September, Motorola introduced an all-electronic alternator system to replace the DC generator and voltage regulator in the automobile. The system, using transistors and diodes exclusively, is designed for maintenance-free operation and extended life. It enables the battery to charge while the motor is idling even with the high electrical current demand of many accessories in operation.

The alternator extends battery life from 25% to 50%, and has particular application in service vehicles which can become costly overhead when inoperable. The system is specially suited to such vehicles as taxi cabs, delivery trucks, farm equipment, and patrol cars which operate for long periods at low speeds and are continually stopping and starting.

A second electronic device, a transistorized ignition system, was announced in November. The system completely eliminates the breaker points and condenser in the distributor. It replaces them with a small magnetic pick-up system which will last the lifetime of the car and does not require the maintenance or adjustment of present ignition devices.

The alternator and ignition systems were

made possible through advances in the transistor and diode art accomplished by Motorola's semiconductor group in Phoenix.

The Automotive Products Division is now offering a unique reverberation system for automobile radios. It is the first mass-produced reverberation system designed for passenger cars, making available "concert hall" radio performance while driving.

The complete transistorization of car radios has become economically practical and the Division has now converted to mass-production of an all-transistor auto radio. The automotive industry is headed for fully transistorized car radios in virtually all 1963 models.

In 1961, Motorola supplied all-transistor radios both for the Lincoln-Continental and the Ford "Thunderbird" models. These have been continued in the 1962 models. Ford Motor Company initiated a change during the year to complete transistorization for most of the 1962 model radios manufactured by Motorola. The "Rambler" car radio is now completely transistorized, as well as radios produced for the Renault Motor Company.

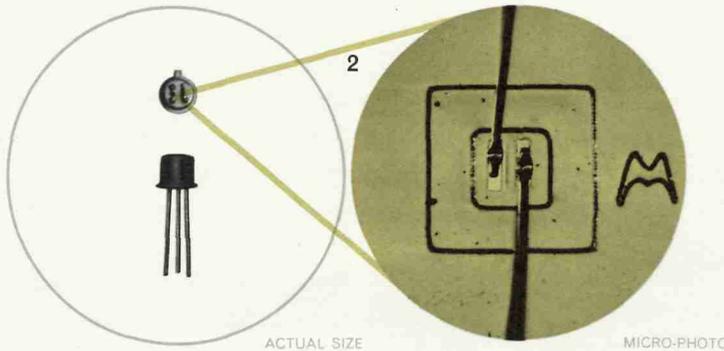
The Automotive Products Division continued to supply radios to Ford, Chrysler, and American Motors in 1961. The total radio requirements were supplied for Ford's "Thunderbird," "Galaxy," "Continental," "Meteor," and "Comet"; American Motors' "Rambler"; Dodge's "Lancer," and Plymouth's "Valiant"; Renault (U.S. sold); and International Harvester.

Automotive Products Division business for the first time became international upon negotiation of a joint venture agreement with a large automotive parts manufacturer in France. A newly formed company will produce Motorola electronic alternator systems for the European market. In addition, samples of the Division's automotive products have been submitted to countries in other parts of the world in prospect of establishing similar joint venture agreements.

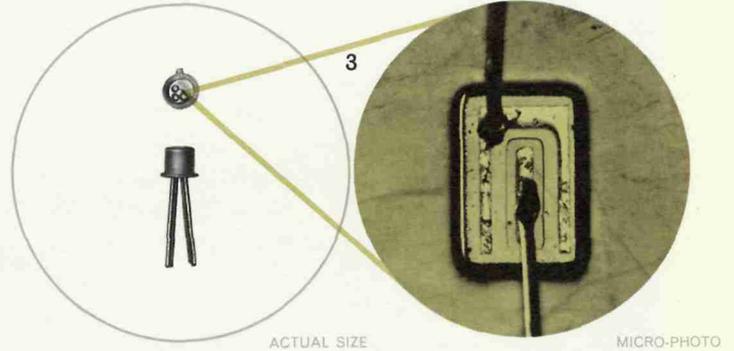
# SEMICONDUCTOR PRODUCTS DIVISION



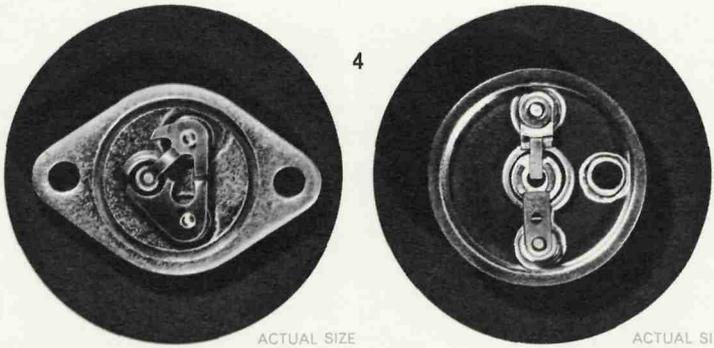
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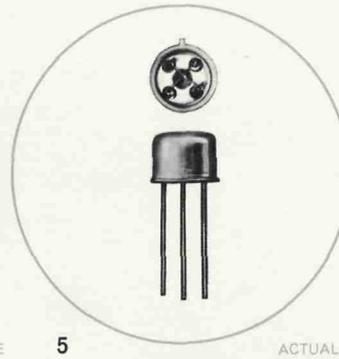
2 ACTUAL SIZE MICRO-PHOTO



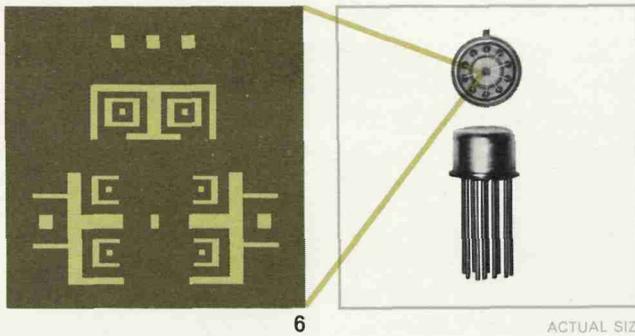
3 ACTUAL SIZE MICRO-PHOTO



4 ACTUAL SIZE ACTUAL SIZE



5 ACTUAL SIZE



6 ACTUAL SIZE

The success of Motorola's semiconductor business in 1961 was due for the most part to eight particular types of devices. These are illustrated on this page. Actual size photographs indicate the tiny dimensions, and microscopic photos show the minute circuit function areas not visible to the eye: 1/ epitaxial star planar transistor • 2/ germanium epitaxial mesa transistor • 3/ silicon epitaxial mesa transistor • 4/ power transistors • 5/ general purpose milliwatt transistor • 6/ integrated "flip-flop" circuit (diagram and actual size) • 7/ zener diode • 8/ automotive silicon rectifier.



7 ACTUAL SIZE



8 ACTUAL SIZE

Expansion, research advances, and addition of new products marked another year of progress for Motorola's Semiconductor Products Division. Dollar sales increased over 40% in spite of the chaotic price competition within the industry. Increased volume offset price reductions, and earnings were maintained at about the favorable level of the previous year.

In May, 1961, the Division expanded its research and production facilities with the opening of a 315,000 square foot addition. This more than doubled its previous operating area, and the facility now has a total of some 536,000 feet.

During 1961, the Division concentrated on the engineering improvement and production expansion of its broad line of semiconductor products which now includes some 4,000 different types. The Division effected major engineering and process improvements in the germanium mesa transistor line, resulting in significant reductions of cost and increases in reliability.

These improvements are being incorporated into the production techniques used in making all Motorola mesa transistors.

Motorola's accomplishment in developing and implementing practical production methods of epitaxial crystal growth has made possible a universal line of high-speed switching transistors. The line literally blankets the major spectrum of computer applications. The epitaxial technique has also enabled the Division to introduce new germanium amplifier transistors which compete in the high-frequency communications market.

The Division introduced the new epitaxial star planar silicon transistor which represents the ultimate in design for maximum operating performance, frequency range, and reliability. It permits a combination of electrical parameters not before possible in a single device. The star planar incorporates in one transistor all of the latest semiconductor technologies, providing

Motorola the capability to advance integrated circuit activity.

All silicon mesa transistor production lines were converted to the epitaxial process during the year.

The Semiconductor Products Division strengthened its position in the industrial and military markets with the addition of a new power transistor design. This provides superior power capability over competitive types. With the inclusion of the devices used in automotive products, Motorola has the most complete line of power transistors currently available.

For the expanding automotive market, Motorola's early development of a low-cost silicon rectifier resulted in the capture of a major part of the volume in this device. The silicon rectifier has made the electronic alternator an economic replacement for the automobile DC generator.

Expansion of the zener diode line to include new devices has established the Division as the leading supplier, having the most complete line in the industry.

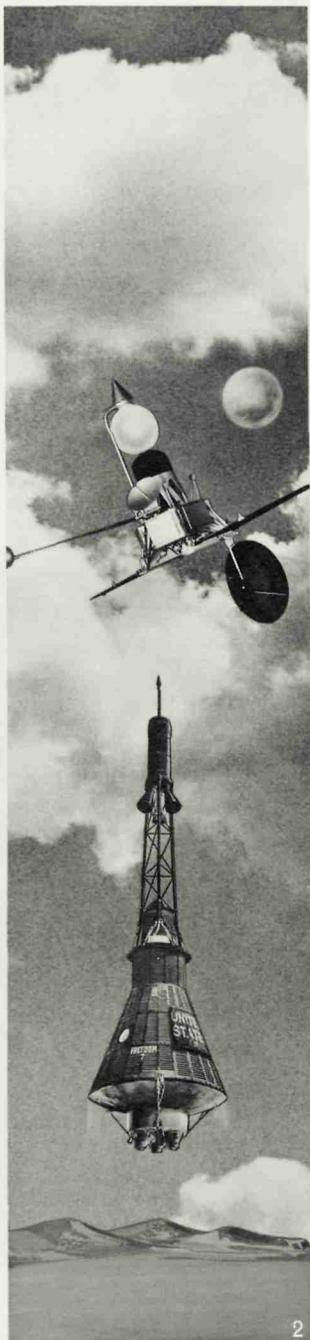
Two years of research effort in micro-miniature solid-state technology, coupled with new advances in the epitaxial technique (considered vital for the fabrication of integrated circuits) qualified the Division for a \$1.5 million Air Force contract for accelerated research and development in this new art. This work—undertaken in cooperation with the continued research in this field by the Solid State Systems Division—is expected to result in maintaining a leading position in the revolutionary technology of integrated circuitry.

Motorola has developed several practical integrated circuit devices which will be introduced early in 1962 for both military and industrial applications. The devices are unique in that they can be used to replace conventional circuits in existing equipment without requiring complete re-design of equipment to conform to the special requirements of integrated circuits.

# MILITARY ELECTRONICS DIVISION



1



2



3

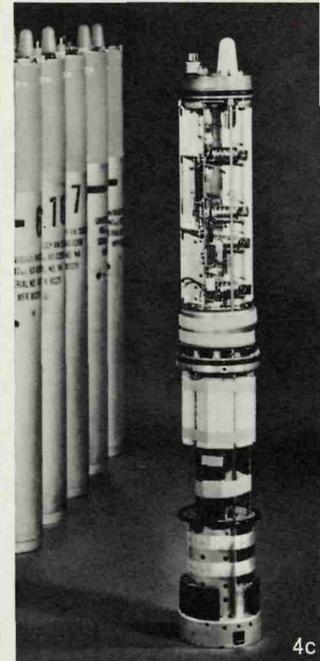
A montage of representative "end-uses" of Motorola Military products: (bottom to top) 1/ *Data Acquisition and Telemetry System*: relays in-flight information from "X-15" manned space probe. 2/ *Space Guidance, Command & Control Systems*: command functions system for Mercury capsule; guidance and command functions system for Ranger space craft. 3/ *Tactical Communications Control and Sensor Equipment*: advanced single-sideband communications system for Army; command and control digital data link used in Navy's anti-submarine warfare system; advanced reconnaissance sensors (APS-94); drone-mounted sidelooking radar. 4/ *Expanding Proprietary Product Line*: (a) electronic teleprinter; (b) family of command receivers and long-range radar transponders; (c) sonobuoys—undersea warfare equipment.



4a



4b



4c

Sales of the Military Electronics Division maintained about the same level as the previous year although the Division reported a major improvement in operating results. The backlog of military contracts rose substantially, establishing a six-year high at the close of 1961.

Current major programs conducted by the Military Electronics Division are serving the armed forces, the National Aeronautical and Space Administration (NASA), the Federal Aviation Agency (FAA), and many prime industrial contractors.

Proprietary product development has assumed an important role at each of the Military centers in Chicago, Illinois; Phoenix, Arizona; and Riverside, California. Emphasis on the generation of these new devices has resulted in contracts with improved long-range production potential.

Prominent among the proprietary products is a family of Motorola "Command Receivers"—used or scheduled for use in more second generation missiles than any similar competitive receiver—and an expanded line of radar transponders used in tracking long-range missiles and spacecraft.

Design-approval models of the Army's AN/USC-3 "Communications System" were delivered in late 1961 for field evaluation. The production pace on this multi-million dollar contract will be stepped up during 1962. The research and development phases of the Motorola-designed APS-94 "Side-Looking Radar" have been completed, and assembly has started on production models of this highly advanced reconnaissance equipment.

The data acquisition and relaying equipment used in picking up in-flight information from the "X-15" manned space probe vehicle was installed on the first half of the test range near Edwards Air Force Base. Designed by the Riverside Systems Research Laboratory and employing microwave relaying units supplied by the Chicago Military Center, this first segment of the

complex data transfer system was accepted as operational by the Air Force and will be used jointly with NASA. Construction of the second half of the system is continuing into 1962.

A new, fully-transistorized microwave product line consisting of RF and multiplex equipment was entering into production at the Chicago Center at year's end.

The Chicago Center delivered to the Navy the first prototypes of an all-solid-state radar indicator. Production quantities of these units will be supplied during 1962.

Other important programs performed during 1961 included the digital data link supplied for the Navy's DASH drone helicopter; a substantial contract for Motorola-designed teleprinter units for use by the Strategic Air Command; and continuing large-volume production of Sonobuoys (under-sea detection devices).

A long-range planning group has been established to study and monitor Air Force and NASA needs for aerospace systems extending into the 1970's. Prominent among the space programs in which Motorola is now participating are the "Mercury," "Saturn," "Ranger," "Mariner," "Advent," and "Midas" programs. In the missile area, Motorola equipment is found on nearly all present and proposed missile systems including "Atlas," "Minuteman," "Pershing," "Polaris," "Bomarc," "Quail," "Sidewinder," and many others.

Indicative of the Company-wide emphasis on solid state integrated circuit implementation are the many advanced programs and techniques within the Military Electronics Division. A formal program is now in progress to assure earliest possible application of available integrated solid state devices to military systems and equipment. This program is closely coordinated with the Solid State Systems and Semiconductor Products divisions to place Motorola in position to aid the country's leadership in advanced military equipment and systems.

# SOLID STATE SYSTEMS DIVISION

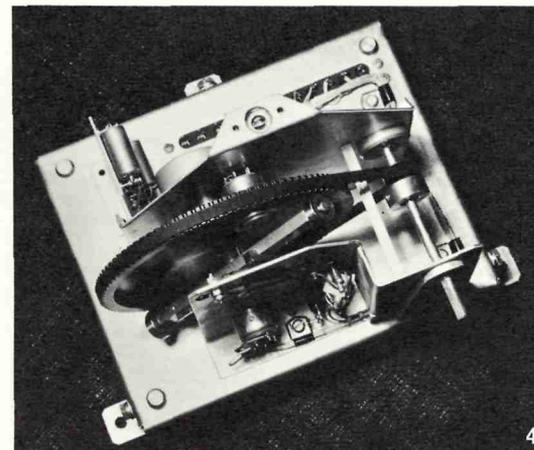
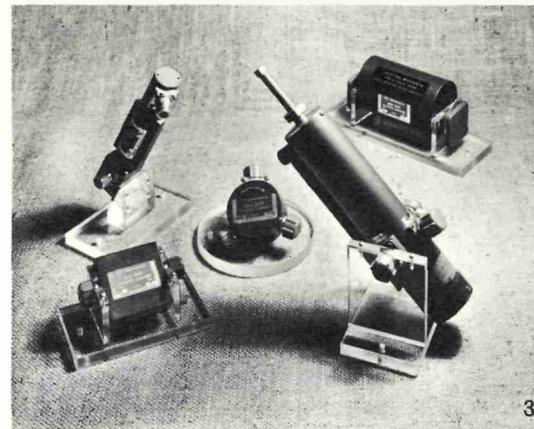
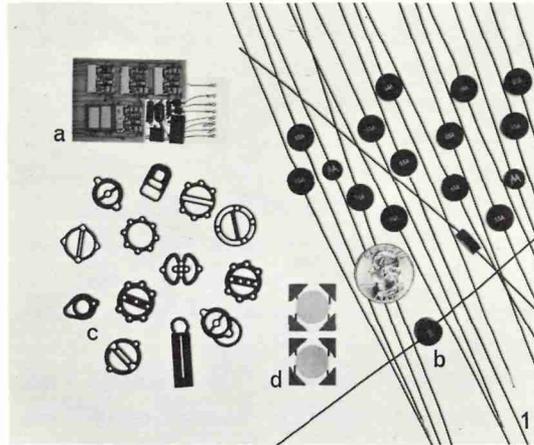
In order to acknowledge the increasing emphasis Motorola is placing on the program and mission of the Solid State Electronics and Controls department in the field of industrial products as well as in military solid state research, the department has been advanced to divisional status under the leadership of Dr. H. W. Welch.

The primary mission of the new Solid State Systems Division is the application of solid state materials, devices, integrated circuits, and techniques to existing equipment and systems—and to develop new product applications of electronics. The Division is organized into three groups designated "Controls Department," "Electronics Department," and "Research Department."

Industrial control system development, production, and sales activities will be carried on by the Controls Department. The first group of new products—designed for remote supervisory control of water, power, oil, and gas distribution systems—is engineered and in production. The first units were placed in the hands of customers in late 1961. A complete line of process control equipment will be released in 1962, and other solid state control applications are undergoing study and development.

The Electronics Department of the Division has on the market a complete line of electromagnetic devices for application in microwave communications and radar systems. Solid state instrumentation for control applications—from refrigeration to space satellites—is under development.

The Research Department will continue its exploration in the fields of electronic ceramics, thin film technology, and solid state device application. Special attention will be given to integrated solid state electronics in an effort to provide unique and advanced features in new products developed by other Motorola divisions.



Among the initial products developed and manufactured by Motorola's new Solid State Systems Division: 1/ (a) thin film voltage digitizer; (b) positive temperature coefficient thermistors; (c) multiaperture magnetic cores; (d) thin film magneto-resistive element; • 2/ "Telememory" supervisory control console; • 3/ a family of microwave devices • 4/ liquid level digitizer.

# INTERNATIONAL OPERATIONS

For the third consecutive year, sales and earnings from Motorola products sold overseas have set new marks. Recorded was an all-time high with an increase in sales over the previous year of about 24%, and a substantial improvement in earnings.

An intensified licensing program, initiated in the latter part of 1958, is now producing results. Progress was made in 1961 in establishing manufacturing arrangements in France, Argentina, Brazil, and Mexico. Manufacturing arrangements in Canada also were strengthened and expanded. Assembly facilities were established in Chile, Uruguay, and Colombia. Total income from overseas licensing during 1961 surpassed any previous year.

Motorola currently is placing emphasis on developing production facilities outside

this country through licensing and joint venture manufacturing arrangements. An international management and organization base has been established to provide a firm planning and marketing structure for this purpose.

A high percentage of international operations is in the sale of communications products. This trend is expected to continue and major attention is being directed at this market area.

Increased emphasis was given to the export sales of automotive and aviation products. Considerable attention also was directed during the year to engineering suitable consumer and communications products to meet the diverse needs of the major world markets. By the end of 1962 there should be visible progress in this program.

# HEARING AIDS AND HOSPITAL COMMUNICATIONS

Indicative of the gradual changes taking place within the Company's hearing aid and hospital communications department is the new trademark establishing identification between the Dahlberg hearing aid group and Motorola. The trademark now appearing on all products and sales literature reads: "Motorola/Dahlberg Hearing Aids."

The Mark IV, a unique and efficient behind-the-ear hearing aid introduced this year, strengthened the Motorola/Dahlberg line of quality instruments. Notable expansion also took place in the sales department in anticipation of increased market activity in 1962.

The hospital communications department fortified its marketing position in

1961 by expanding and strengthening the product line. Additions included: a miniaturized low-frequency pocket radio pager; a low-priced hospital TV set; an inter-communications system; a doctor's register system; and a manual nurse-call system. These new products, added to the existing line of Motorola/Dahlberg hospital products, place the Company in the position of producing the most complete hospital communications line in the industry.

Sales responsibility for hospital communications systems was transferred during the year to Motorola's Communications Division for purposes of maximum market coverage, systems engineering, and service.

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# FINANCIAL REPORT

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The annual meeting will be held on Monday, May 7, 1962. A notice of the meeting, together with a form of proxy and a proxy statement, will be mailed to shareholders on or about April 9, 1962, at which time proxies will be solicited by the management.

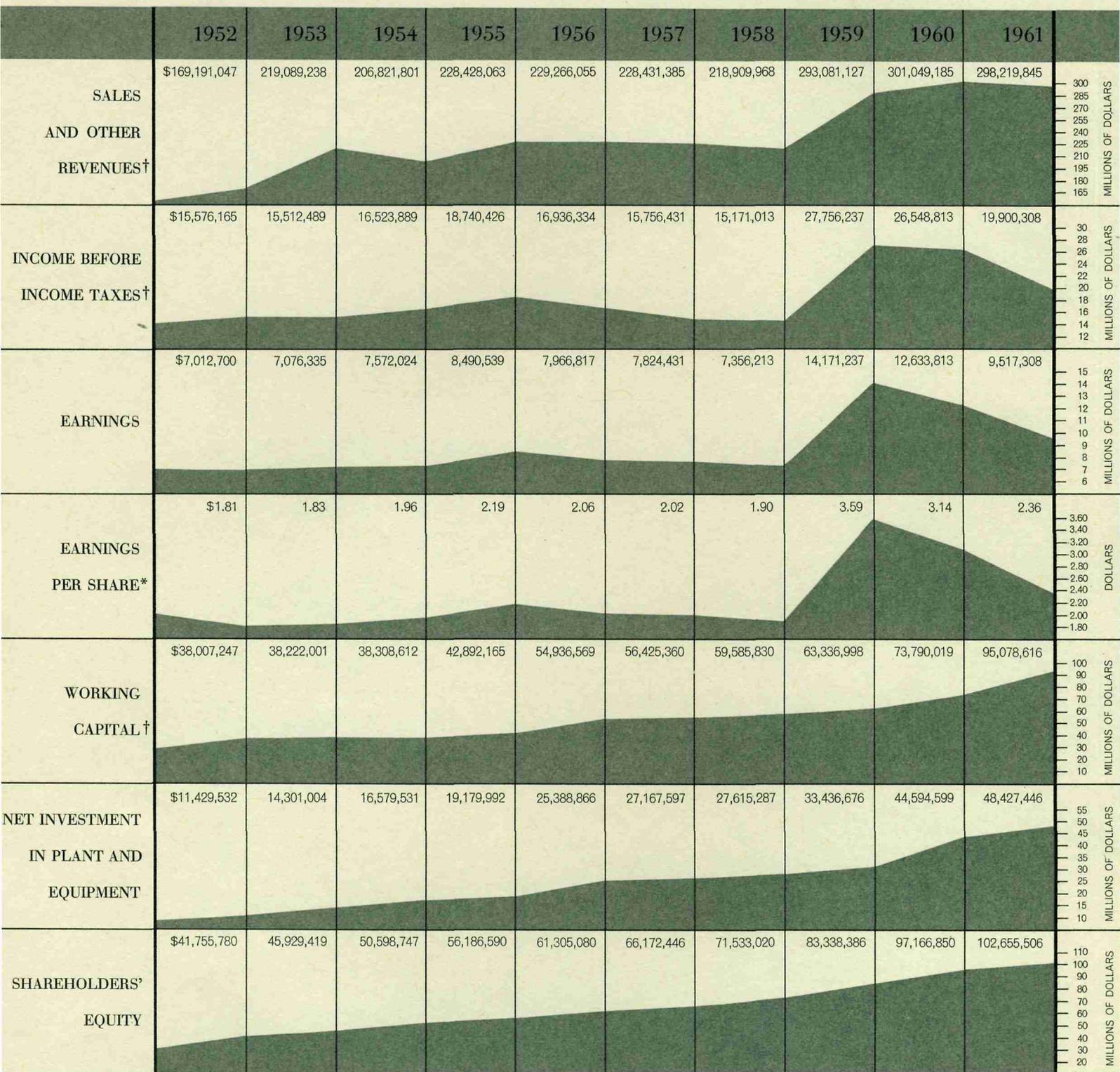
TRANSFER AGENTS: Harris Trust and Savings Bank  
111 W. Monroe St., Chicago 90, Illinois

Chemical Bank New York Trust Company  
165 Broadway, New York 15, New York

REGISTRARS: Continental Illinois National Bank and  
Trust Company of Chicago  
231 S. LaSalle St., Chicago 90, Illinois

Irving Trust Company  
1 Wall St., New York 15, New York

# TEN YEAR FINANCIAL SUMMARY



† Restated to include Motorola Finance Corporation, a wholly-owned subsidiary, organized in 1956 and not consolidated prior to 1961.

\* Earnings per share are based on the number of shares outstanding at the end of the respective years, adjusted for subsequent share distributions.

# Motorola, Inc. and Subsidiaries

## STATEMENT OF CONSOLIDATED EARNINGS AND RETAINED EARNINGS

| Years ended December 31  | 1961                 | 1960                 |
|--|----------------------|----------------------|
| <b>Sales and other revenues</b>  | <u>\$298,219,845</u> | <u>\$301,049,185</u> |
| Manufacturing and other costs of sales   | 214,871,908          | 218,874,056          |
| Selling, service, and administrative expenses  | 52,409,790           | 43,649,804           |
| Depreciation of plant and equipment  | 5,276,286            | 4,475,463            |
| Contribution to employees' profit sharing fund   | 2,624,174            | 4,610,393            |
| Interest and amortization of debenture expense   | <u>3,137,379</u>     | <u>2,890,656</u>     |
| <i>Total costs and other expenses</i>  | <u>278,319,537</u>   | <u>274,500,372</u>   |
| Income before federal income taxes   | 19,900,308           | 26,548,813           |
| Federal income taxes   | <u>10,383,000</u>    | <u>13,915,000</u>    |
| <b>Earnings</b> (per share outstanding at end of year: 1961, \$2.36; 1960, \$3.14)               | 9,517,308            | 12,633,813           |
| Retained earnings at beginning of year   | <u>71,242,879</u>    | <u>68,429,207</u>    |
| <i>Total</i>   | <u>80,760,187</u>    | <u>81,063,020</u>    |
| Cash dividends declared (per share: 1961, \$1.00; 1960, \$.9375)                                 | 4,028,652            | 3,777,163            |
| Share-for-share distribution—par value of 2,014,326 shares, transferred to capital stock account | —                    | 6,042,978            |
| <i>Total deductions</i>  | <u>4,028,652</u>     | <u>9,820,141</u>     |
| Retained earnings at end of year (note 6)  | <u>\$ 76,731,535</u> | <u>\$ 71,242,879</u> |
| See accompanying notes to financial statements.  |                      |                      |

### Accountants' Report

#### The Board of Directors and Shareholders of Motorola, Inc.:

We have examined the consolidated balance sheet of Motorola, Inc. and subsidiaries as of December 31, 1961 and the related statement of earnings and retained earnings for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. It was not practicable to confirm accounts receivable from United States government departments or agencies by communication with them but we satisfied ourselves as to such accounts by means of other auditing procedures.

In our opinion, the accompanying consolidated balance sheet and statement of consolidated earnings and retained earnings present fairly the financial position of Motorola, Inc. and subsidiaries at December 31, 1961 and the results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

# Motorola, Inc. and Subsidiaries

## CONSOLIDATED BALANCE SHEET AS OF DECEMBER 31

| ASSETS   | 1961                 | 1960                 |
|--|----------------------|----------------------|
| <i>Current assets:</i>   |                      |                      |
| Cash   | \$ 8,794,244         | \$ 13,402,720        |
| Receivables:   |                      |                      |
| Accounts:  |                      |                      |
| United States government   | 7,773,137            | 8,085,819            |
| Other  | 47,714,344           | 44,179,507           |
| Notes and contracts:   |                      |                      |
| Lease and conditional sales contracts—net (note 2)                                 | 32,725,036           | 23,952,381           |
| Other  | 8,011,781            | 6,977,559            |
| Allowance for doubtful accounts  | (1,801,559)          | (1,817,000)          |
| Costs recoverable under United States government contracts, less progress billings | 8,440,774            | 5,921,763            |
| Inventories, at the lower of average cost or market                                | 39,958,980           | 37,746,611           |
| Other current assets   | <u>2,865,560</u>     | <u>2,555,633</u>     |
| <i>Total current assets</i>  | 154,482,297          | 141,004,993          |
| Plant and equipment—less depreciation (note 3)                                     | 48,427,446           | 44,594,599           |
| Sundry assets  | 3,648,892            | 3,949,880            |
| Patents, debenture expense, and other deferred items—less amortization             | <u>1,242,955</u>     | <u>1,642,169</u>     |
|  | <u>\$207,801,590</u> | <u>\$191,191,641</u> |
| See accompanying notes to financial statements.                                    |                      |                      |

### Notes to Financial Statements

1/The 1961 consolidated financial statements include the accounts of Motorola, Inc. and all subsidiaries. Motorola Finance Corporation, wholly owned but previously not consolidated, has been consolidated in 1961 because the subsidiary's operations are now financed wholly by Motorola, Inc.; the 1960 financial statements included herein have been restated for comparison. Such restatement had no effect on 1960 net earnings or retained earnings. Foreign subsidiaries previously not consolidated are consolidated in 1961, with no material effect upon net earnings.

2/The lease and conditional sales contracts include amounts due after one year (1961, \$27,120,000; 1960, \$19,690,000) and are net of unearned finance charges (1961, \$7,900,455; 1960, \$5,884,863).

3/The companies' investment in plant and equipment at December 31, 1961 and 1960 was as follows:

|   | 1961                | 1960                |
|---|---------------------|---------------------|
| Land—at cost  | \$ 3,395,726        | \$ 3,416,284        |
| Buildings—at cost, less depreciation (1961, \$8,902,050; 1960, \$6,906,679)                 | 28,569,406          | 26,459,507          |
| Machinery and equipment—at cost, less depreciation (1961, \$12,555,411; 1960, \$10,881,098) | 14,451,480          | 12,856,592          |
| Dies, tools, and leasehold improvements—at cost, less amortization                          | 2,010,834           | 1,862,216           |
| Total   | <u>\$48,427,446</u> | <u>\$44,594,599</u> |

| LIABILITIES  | 1961                 | 1960                 |
|--|----------------------|----------------------|
| <i>Current liabilities:</i>  |                      |                      |
| Notes payable to banks and others  | \$ 20,500,000        | \$ 34,350,000        |
| Current maturities of long-term debt   | 1,064,422            | 1,060,016            |
| Accounts payable—trade   | 14,085,533           | 9,547,165            |
| Accrued taxes  | 9,033,724            | 8,399,919            |
| Contribution to employees' profit sharing fund   | 2,624,174            | 4,610,393            |
| Product and service warranties   | 969,649              | 915,328              |
| Other  | <u>11,126,179</u>    | <u>8,332,153</u>     |
| <i>Total current liabilities</i>   | <u>59,403,681</u>    | <u>67,214,974</u>    |
| Long-term debt (note 4)  | <u>45,742,403</u>    | <u>26,809,817</u>    |
| Shareholders' equity:  |                      |                      |
| Capital stock, \$3.00 par value. Authorized, 6,000,000 shares; outstanding, 4,028,652 shares (net of 1,610 treasury shares) (note 5) | 12,085,956           | 12,085,956           |
| Additional paid-in capital   | 13,838,015           | 13,838,015           |
| Retained earnings (note 6)   | <u>76,731,535</u>    | <u>71,242,879</u>    |
| <i>Total shareholders' equity</i>  | <u>102,655,506</u>   | <u>97,166,850</u>    |
|  | <u>\$207,801,590</u> | <u>\$191,191,641</u> |

4/Long-term debt at December 31, 1961 and 1960 consisted of the following:

|   | 1961                | 1960                |
|---|---------------------|---------------------|
| 4¾% debentures due April 1, 1986 (with annual sinking fund requirements commencing in 1967)           | \$30,000,000        | \$ —                |
| Notes payable:  |                     |                     |
| 3¾%, due \$1,000,000 annually to 1965, \$1,500,000 in 1966, and \$500,000 annually thereafter to 1972 | 8,500,000           | 9,500,000           |
| 4¾%, due \$500,000 annually 1963-1976   | 7,000,000           | 7,000,000           |
| 4¾%, due 1963-1965  | —                   | 10,000,000          |
| Real estate mortgages   | 1,306,825           | 1,369,833           |
|   | <u>46,806,825</u>   | <u>27,869,833</u>   |
| Less current maturities, included in current liabilities  | 1,064,422           | 1,060,016           |
| Noncurrent portion of long-term debt  | <u>\$45,742,403</u> | <u>\$26,809,817</u> |

5/Under the Employee Share Option Plan adopted in 1960, options may be granted to key employees to purchase Motorola, Inc. shares at not less than 95% of market value at date of grant. During 1961 options for the purchase of 7,300 shares were granted and options for 600 shares were terminated, leaving outstanding at December 31, 1961 options for 43,000 shares at a price of \$73.25 per share and 7,300 shares at a price of \$83.875 per share. An additional 149,700 shares are reserved for options which may be granted by the Board of Directors until May 2, 1965. The options granted may be exercised two years after the date of grant; they expire at the end of ten years, and are contingent upon continued employment by the company and its subsidiaries.

6/At December 31, 1961 approximately \$15,500,000 of retained earnings was free from dividend restrictions contained in the debenture and note agreements.

7/The companies are obligated under repurchase and other agreements, principally in connection with the financing of sales of products to consumers, and are defendants in suits and claims, none of which it is believed will have any material effect on the business of the companies.

## DIRECTORS AND OFFICERS

### ROBERT W. GALVIN

DIRECTOR, PRESIDENT

### ALEX ARNOLD

VICE PRESIDENT, CONTROLLER

### MATHEW J. HICKEY, JR.

DIRECTOR

### ALLEN H. CENTER

VICE PRESIDENT, PUBLIC RELATIONS

### DANIEL E. NOBLE

DIRECTOR, EXECUTIVE VICE PRESIDENT,  
COMMUNICATIONS, SEMICONDUCTOR,  
MILITARY ELECTRONICS, AND  
SOLID STATE SYSTEMS DIVISIONS

### JOSEPH A. CHAMBERS

VICE PRESIDENT AND MANAGER, WESTERN CENTER,  
MILITARY ELECTRONICS DIVISION

### FRANK J. O'BRIEN

DIRECTOR, VICE PRESIDENT, PURCHASING

### JOHN I. DAVIS

VICE PRESIDENT,  
CONSUMER PRODUCTS ENGINEERING

### ARTHUR L. REESE

DIRECTOR, VICE PRESIDENT AND GENERAL MANAGER,  
COMMUNICATIONS DIVISION

### SYLVESTER R. HERKES

VICE PRESIDENT,  
CONSUMER PRODUCTS MARKETING

### WALTER B. SCOTT

DIRECTOR, VICE PRESIDENT,  
CONSUMER AND AUTOMOTIVE PRODUCTION

### C. LESTER HOGAN

VICE PRESIDENT AND GENERAL MANAGER,  
SEMICONDUCTOR PRODUCTS DIVISION

### EDWARD R. TAYLOR

DIRECTOR, EXECUTIVE VICE PRESIDENT,  
CONSUMER PRODUCTS DIVISION

### HOMER L. MARRS

VICE PRESIDENT,  
COMMUNICATIONS SALES

### EDWIN P. VANDERWICKEN

DIRECTOR, VICE PRESIDENT FOR FINANCE,  
TREASURER, AND SECRETARY

### KENNETH M. PIPER

VICE PRESIDENT,  
HUMAN RELATIONS

### ELMER H. WAVERING

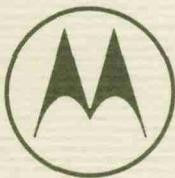
DIRECTOR, EXECUTIVE VICE PRESIDENT,  
AUTOMOTIVE PRODUCTS DIVISION

### WILLIAM J. WEISZ

VICE PRESIDENT,  
COMMUNICATIONS PRODUCTS

### WILLIAM S. WHEELER

VICE PRESIDENT AND GENERAL MANAGER,  
MILITARY ELECTRONICS DIVISION



**MOTOROLA INC.** / 9401 West Grand Avenue, Franklin Park, Illinois

MAJOR FACILITIES LOCATED IN: ARCADE, NEW YORK • CHICAGO, FRANKLIN PARK, AND QUINCY, ILLINOIS  
MINNEAPOLIS, MINNESOTA • PHOENIX AND SCOTTSDALE, ARIZONA • CULVER CITY AND RIVERSIDE, CALIFORNIA

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*Motorola Products* · **AUTOMOTIVE PRODUCTS** · CAR RADIOS · PUSHBUTTON TRANSMISSION CONTROLS · ALTERNATOR SYSTEMS · TRANSISTORIZED IGNITION SYSTEMS

**COMMUNICATIONS PRODUCTS** · TWO-WAY RADIO—MOBILE, PORTABLE AND BASE STATION EQUIPMENT, PUSHBUTTON MOBILE RADIO-TELEPHONE, ANTENNAS, TOWERS, ACCESSORIES AND PARTS, CONTRACT MAINTENANCE AND INSTALLATION SERVICE · AUTOMATIC CAPACITANCE SWITCHING FOR ELECTRIC UTILITIES · ELECTRONIC SIGNALING DEVICES · CLOSED CIRCUIT TELEVISION EQUIPMENT · MICROWAVE RELAY SYSTEMS · RADIO TRAFFIC LIGHT CONTROL · RADIO PAGING SYSTEMS · POWER MEGAPHONES · PRECISION TEST AND MEASUREMENT EQUIPMENT · "SELCAL" SELECTIVE CALLING EQUIPMENT FOR AIRLINES · AIRCRAFT VHF NAVIGATION AND COMMUNICATIONS EQUIPMENT · AIRCRAFT AUTOMATIC DIRECTION FINDERS · AUTOMATIC FLIGHT CONTROL SYSTEMS

**CONSUMER PRODUCTS** · TELEVISION RECEIVERS · STEREOPHONIC HIGH FIDELITY PHONOGRAPHS · AM AND AM-FM TABLE RADIOS · CLOCK AND PORTABLE RADIOS · AM AND FM CAR RADIOS · ALTERNATOR SYSTEMS, ANTENNAS, ACCESSORIES, AND PARTS

**DAHLBERG PRODUCTS** · HEARING AIDS · HOSPITAL COMMUNICATIONS SYSTEMS

**MILITARY ELECTRONICS PRODUCTS** · RADAR · COMMUNICATIONS SYSTEMS · MISSILE GUIDANCE SYSTEMS · INDICATORS AND DISPLAY SYSTEMS · ANTI-SUBMARINE WARFARE EQUIPMENT · DATA LINK SYSTEMS · NAVIGATION EQUIPMENT · TELEMETERING SYSTEMS · DRONE CONTROL SYSTEMS · GROUND SUPPORT, TRAINING, AND TEST EQUIPMENT · ELECTRONIC COUNTERMEASURE SYSTEMS · FLIGHT SAFETY EQUIPMENT

**SEMICONDUCTOR PRODUCTS** · POWER TRANSISTORS · MESA TRANSISTORS · GENERAL PURPOSE TRANSISTORS · INDUSTRIAL AUDIO TRANSISTORS · INDUSTRIAL SWITCHING TRANSISTORS · RECTIFIERS · ZENER DIODES

**SOLID STATE PRODUCTS** · PROCESS MEASUREMENT AND CONTROL SYSTEMS · REMOTE SUPERVISORY CONTROL SYSTEMS · ANALOG AND DIGITAL INSTRUMENTATION · ELECTROMAGNETIC DEVICES · INTEGRATED ELECTRONIC SUB-ASSEMBLIES.

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